

March 10, 2000

SPACE CENTER Roundup

VOL. 39, NO. 5 LYNDON B. JOHNSON SPACE CENTER, HOUSTON, TEXAS



NASA Photo S99E5475

Map quest a success STS-99 brings home unrivaled imaging

Clockwise from right to left: Commander Kevin Kregel, Pilot Dom Gorie and Mission Specialist Mamoru Mohri, Janice Voss, Gerhard Thiele and Janet Kavandi.

Marking an early success for the year 2000, STS-99 returned home last month concluding the first human space flight of the 21st Century and gathering Earth mapping and image data unlike any ever achieved before.

Endeavour lifted off with its six-member crew on February 11 to begin the Shuttle Radar Topography Mission—a project that will result in the most detailed and accurate map of our planet. The international STS-99 crew, including Commander Kevin Kregel, Pilot Dom Gorie and Mission Specialist Janice Voss, Janet Kavandi, Gerhard Thiele and Mamoru Mohri, split into two teams to complete the round-the-clock mapping efforts that when finished, would represent more than 70 percent of Earth's surface.

A main antenna assembly inside the payload bay anchored X-band and C-band radars aimed toward Earth. Outside, a

200-foot-long boom, the longest fixed structure ever deployed in space, protruded from the orbiter's payload bay. The boom supported an outboard antenna assembly to receive the reflected X-band and C-band radar signals. Combining the data from both radar bands received by both of the antennas will allow scientists on Earth to develop the highest-resolution, digital 3-D topographic Earth database.

The mapping, which promises to be 30 times more accurate and more unified than existing global maps, will be useful to scientists as well as in military and commercial applications.

The mapping activity began as early as flight day two and continued through stowage of the mast, resulting in 222 hours and 23 minutes of data gathering that mapped almost 100 percent of the originally targeted area. Scientists were elated by the results and the amount of mapping that was

Made of carbon fiber reinforced plastic, stainless steel, alpha titanium, and Invar, the Shuttle Radar Topography Mission mast is a truss structure that consists of 87 cube-shaped sections called bays. Unique latches on the diagonal members of the truss allow the mechanism to deploy bay-by-bay out of the mast canister to a length of 60 meters (200 feet), about the length of five school buses.

achieved considering a launch delay and an in-flight anomaly almost compromised the mapping schedule.

SRTM program scientist Dr. Earnest Paylor described the mission as “a magnificent accomplishment,” noting that equatorial regions of the Earth previously unmapped due to constant cloud cover have been mapped by SRTM radar. Tom Hennig, SRTM program manager for the National Imagery and Mapping Agency, called the success of the mission “absolutely wonderful.”

EarthKAM, a digital camera mounted on *Endeavour's* flight deck, also had a successful run during STS-99. The camera, which is used by middle school students around the country, set a record, capturing more than 2,715 images during its 225 hours of operation in flight—more than were produced during its first four flights combined.

Endeavour's mission was remarkably successful. One issue was discovered on flight day two when controllers noted an anomaly with a small nitrogen thruster mounted at the tip of the radar's outboard antenna. The thruster was designed to help

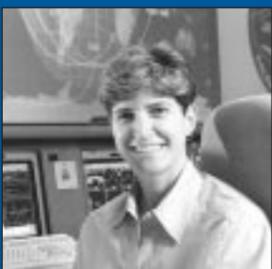
control the mast's attitude. Controllers determined that propellant was flowing; however, it was not resulting in any detected thrust.

The dilemma threatened to cut the mission short. Without the thruster, crewmembers would have had to fire the orbiter's thrusters more than expected, using fuel intended for shuttle maneuvering.

To mitigate the effects of the mast thruster failure, controllers developed and implemented propellant conservation measures. They also were able to ease requirements for mast thrusting due to the better-than-expected stability of the mast, and the mission ran its full 11 days.

After one waved off landing opportunity earlier in the day due to strong cross winds, the 4.7-million-statute-mile radar mapping mission concluded at sunset February 22. *Endeavour* touched down at 5:22 p.m. Central time on Runway 33 at the three-mile-long Shuttle Landing Facility at Kennedy Space Center.

The crew was welcomed home in Houston the following day at a crew return event at Ellington Field. ■



JSC celebrates Women's History Month.

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Students plan for Mars exploration.

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SkyWatch website tracks spacecraft.

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JSC's Federal Women's Program manager reports that the role of women at the center has changed dramatically over the past two decades, and continues to evolve.

"Women and men have created a partnership in the workplace," said Jessie Hendrick, FWP manager. "For JSC, this partnership becomes more crucial as we all work together to meet the challenges of the future."

One need only examine the changes in the workforce from May 1980 to March 2000 to see the history and progress of

"As these statistics indicate, there have been many improvements for women during the last 20 years at JSC," said Hendrick. "Women are in every job classification at JSC. Over the past two decades, women have become members of senior staff, chief scientists, and one has commanded a shuttle mission. Women are working on new projects such as the X-38 and International Space Station. And women have chaired major center committees including the Johnson Space Center Safety Action Team and Inspection '99."

Celebrating National Women's History Month

Statistics show improvements for women in JSC workforce

women at JSC, Hendrick said. Today's figures show that there are 994 women employees (34.7 percent) at JSC out of 2,863 permanent full-time employees. That's an increase from 1980, when the numbers were 719 women employees (21 percent) out of 3,420 permanent full-time employees.

In 1980, the professional classification was comprised of engineering support, science and engineering, life sciences, and administration. The 1980 figures show that there were 2,575 professionals of which 205 were female or eight percent. Using the 1980 classification of professional, today there are 2,469 professionals, of which 705 are female or 28.6 percent. In 1980, two women had achieved a GS-15 grade, the highest grade for any JSC female employee at the time. Currently, there are 76 women and 326 men who hold the GS-15 grade. The highest grade possible is Senior Executive Service; six women and 57 men have achieved that rank. In addition, there were 13 women supervisor/managers out of approximately 493 in 1980; now there are 56 women out of 265.

The next category reviewed in 1980 was that of technicians and clerical staff. In 1980, three out of five employees in this category were women. The category included 303 technicians, of which 14 were women, and 542 clerical workers, of which 500 were women. Now, three out of four employees are women. There are 116 technicians, of which 15 are women, and 277 clerical employees, of which 274 are women.

According to Hendrick, the keys to advancement for these women have been education and the opportunities to apply their knowledge. Education includes any formal or continuing education and skills enhancement. JSC is very fortunate to have the Human Resources Development Branch, which provides access to multidisciplinary courses to assure enhancement in a variety of skills from basic to advanced.

But employees also need arenas in which to practice these skills. With the help of their management, all employees should look for opportunities to improve existing skills and develop new ones. These opportunities may include rotational assignments, special projects, chairing a committee, or working on teams.

As recently as the 1970s, women's history was almost unknown in the K-12 curriculum. To address this situation, a "Women's History Week" was initiated in Sonoma County, California, in 1978.

Recognition of women's history began with a Congressional Resolution that called upon the nation to celebrate National Women's History Week in 1981. That observance has now grown to a National Women's History Month, celebrated in March, and was first recognized in 1987 by a Congressional Resolution. During Women's History Month, American women of every ethnic background are honored for their historic contributions to the growth and strength of our nation. ■

Collins rings opening bell at New York Stock Exchange



Richard A. Grasso, left, chairman and CEO of the New York Stock Exchange, and William R. Johnston, president of the NYSE, join NASA Astronaut Col. Eileen Collins as she rings the opening bell above the Exchange's trading floor.

Perhaps the New York Stock Exchange should consider inviting NASA Astronaut Col. Eileen Collins to ring the opening bell more often. On the day that she rang the bell January 7, 2000, the Dow Jones Industrial Average rose 269 points.

From December 15, 1999, through January 10, 2000, the NYSE honored a select number of internationally distinguished individuals who made a difference during the 20th Century, individuals who enriched humanity and helped bring about a

better world by their values and ideals, by inviting them to "ring the bell" above the Exchange's trading floor. NYSE Chairman and CEO Richard Grasso invited Collins to participate in this special millennium event in recognition of her contributions to society, science and exploration.

Other individuals who participated in this special monthlong celebration at the NYSE include Joe Namath and Muhammed Ali.

"It was a great opportunity to talk to the personnel who run the New York Stock Exchange," said Collins, reflecting on her

experience. "They were very interested in NASA's mission, in particular what NASA's plans are for the future and the human side of the space experience. In exchange, I got a close-up look at the day-to-day operations of a stock exchange and how technology is changing the way they do business."

Collins' visit to the NYSE included a breakfast in her honor, a 15-minute talk to a group of executives, ringing the opening bell, media events, and a walk around the trading floor of the exchange. ■

Stepfamilies to be subject of presentation

Dr. James H. Bray, director of Family Psychology Programs and associate professor in the Department of Family and Community Medicine at Baylor College of Medicine in Houston, will address current issues on divorce and stepfamilies in a special presentation March 29 at JSC. He will discuss many of the situations unique to stepfamilies and will offer suggested solutions.

Dr. Bray, sponsored by the Employee Assistance Program, has appeared on many national television programs, including *The Today Show*, *Good Morning America*, and *20/20*. He and collaborator, John Kelly, have also published a book based on his research work with stepfamilies entitled *Stepfamilies: Love, Marriage, and Parenting in the First Decade* (Broadway Books, 1998).

Stepfamilies, Love, Marriage, and Parenting

James H. Bray, Ph.D.

March 29, 2000

Noon - 1 p.m.

Building 30 Auditorium

C O M M U N I T Y N E W S**Conference provides educators a lesson about space station**

The International Space Station will be the subject of many more exciting and creative lessons for schoolchildren around the country. That is the hope for organizers of Space Center Houston's sixth annual ISS Educators Conference held February 4 and 5.

More than 500 educators participated in the two days of networking, lectures and workshops on ISS education techniques and activities while expanding their own personal knowledge of science, math and space program concepts and status. Nearly 100 different breakout sessions were offered highlighting various projects and methods for incorporating space and ISS into multidisciplinary lesson plans.

NASA was a partner for the event and many JSC employees were featured instructors and guest speakers including ISS Program Chief of Staff Bill Bates, Jack Bacon of ISS Systems Engineering & Integration, Expedition One Commander William Shepherd and STS-96 Mission Specialist Ellen Ochoa. Roger Crouch, chief scientist for microgravity at NASA Headquarters, also addressed the visitors.

The ISSEC attracted guests from all corners of the country, and not just classroom teachers. Dave Schaar, an educational workshops coordinator from SciTrek science and technology museum

in Atlanta, Georgia, was a first-time visitor to the conference and said the event was rich with useful ideas and concepts.

"I'm always curious as to new ways to get kids excited about science in the classroom," said Schaar. "It's one thing to talk to them about how exciting science can be but it's a lot better when you can show them through hands-on exercises."

Although many of the visitors were seeking ways to apply the ideas to math and science lessons, many of the instructors emphasized that the activities could be used to reinforce other subjects.

Linda Helmke, an ISSEC guest instructor and teacher advisor from Saskatoon Public School District in Canada, led a session entitled "A Day on the International Space Station." Designed for students kindergarten through fifth grade, Helmke's project entailed using yards of black plastic to recreate a classroom into a simulated space station complete with twinkling lights for stars and large planets on the horizon.

ISSEC is a blessing for many of the educators who seek material and resources for space curricula. They frequently walk out of the conference with a head full of fresh new ideas and arms full of resource materials – renewed and invigorated by the possibilities of space. ■



ISSEC organizers wish to thank all of the JSC volunteers and The Boeing Company for their support of the event.

NASA JSC Photo 2000-01180 by Bill Stafford
Space Center Houston hosted more than 500 educators in its sixth annual International Space Station Educators Conference. During the two-day event, guests participated in lectures and workshops to discover new techniques to share the excitement of space with students.

Johnson Space Center blood donor receives recognition

Gary Kane, a JSC retiree, recently received a plaque from St. Luke's Episcopal Hospital honoring him for his outstanding record of donating blood over the years.

Stephanie Logsdon, St. Luke's Blood Donor Program manager, and George Abbey, JSC director, presented the plaque and congratulated Kane for donating more than 14 gallons of blood – the highest number of donations on record with St. Luke's for any current or former JSC employee. Abbey also thanked Kane for his 33 years of loyal service with JSC and 40 years of federal service. Abbey commended Kane, and all JSC blood donors, for contributing to this worthwhile cause.

Kane worked in the Mission Operations Directorate for much of his career, and worked in the Systems Management Office most recently. He started donating blood here at JSC in 1971. He's contributed between three and six times a year since then, sometimes donating at St. Luke's Hospital downtown location between JSC blood drives.

Kane explained, "I believe the thing that got me involved was the realization that until an artificial substitute can be utilized for blood, donors are an absolute necessity for the health and

well-being of the community." He plans to continue donating at the JSC on-site blood drives as a retiree.

Donations from JSC blood drives are frequently used to help employees, their

families, and other community members who have undergone heart surgery or had diseases like leukemia, cancer, or hemophilia. At JSC's recent January blood drive, donors gave 538 units of blood, the second best showing since JSC began its partnership with St. Luke's. The timing was great because a critical blood supply shortage was threatening to cause delays to a number of surgeries at the time.

JSC's next blood drive will be held from 7:30 a.m. to 4 p.m. March 29 and 30. The blood drive will be conveniently staged in the Teague lobby in Bldg. 2. No appointment is needed to donate whole blood. Appointments are encouraged for those wishing to donate plasma or platelets. To schedule an appointment, call Donna Stuart at x33032.

For more information about donating blood, see the blood drive Web site located on the Human Resources Office homepage. Or, if you have a specific question about how a medical condition may affect your ability to give blood, call St. Luke's Blood Donor Center at (713) 791-4483. ■



NASA JSC Photo 2000-01267 by James Blair
JSC Director George Abbey, left, and Stephanie Logsdon, St. Luke's Blood Donor Program manager, right, present a plaque to recently retired JSC employee Gary Kane in recognition of his outstanding record of donating blood over the years.

Energy industry leader offers survival tips

If there is anyone out there who has endured some of Houston's most trying times and demonstrated how to successfully navigate an organization through the strains of change, it is former Reliant Energy CEO Don Jordan. With more than 40 years in the energy industry, Jordan recently imparted some of his lessons learned to a crowd of JSC's leaders.

Jordan, president of the World Energy Council, was a featured speaker as part of the George M. Low Leadership Series, a continuing lecture series initiated by JSC Center Director George W. S. Abbey to help center leaders learn from government and industry peers.

Jordan's vast experience with the energy company includes its transitions from Houston Lighting & Power Company to

Houston Industries and more recently, to Reliant Energy. Those transitions, he says, parallel many challenges that the space program also faces.

"The technological and economic mountains that you must climb in business really challenge your imagination," said Jordan. "NASA's work makes business dim by comparison, but I suggest that many of the same principles that we have to follow in business to be successful might apply well here at NASA as well."

According to Jordan, times of dramatic and complicated change require many skills of an effective leader in order for an

organization to survive, not the least of which is proactive communication.

"Good communication is always critical, but it's also the easiest to forget, especially in times of change - when the business is under pressure," said Jordan. "Employees will feel resistance to change and threatened if they don't understand the changes. They have to feel that their role is important in order for them to gain that sense of urgency to reach the organization's goals."

Jordan cited the early days of the space program, when there was no shortage of passion or financial support for space

exploration, but says today's economy paints a different picture. "I bet many of you from the early days of the NASA program would not have predicted that the marketing of the economic benefits of the space program to the American public and to Congress would have become such an integral part of your job and key to your survival."

Yet, he says, with the ability to identify industry trends, gauge their importance and relevance to your organization and respond accordingly, you can adapt to the new demands and succeed in the new paradigm.

"Although change at the magnitude that Reliant Energy and NASA have seen can be unsettling and downright frightening, it is usually inevitable and will create great opportunities for us both." ■



Don Jordan

Students prepare Red Planet for future visitors

One hundred forty-four high school students, some of whom may live on Mars one day, got a chance to plan what living and working conditions will be on the Red Planet during the second annual JSC Mars Settlement Design Competition.

The students took up residence at JSC the weekend of February 11-13, designing living and working quarters for a human settlement on Mars. They participated in a Mars-focused version of the Space Settlement Design Competition, a program that began in California in 1984 to introduce students to the skills they will need when they join industry.

"The tremendous student enthusiasm we encountered last year during our initial competition, which attracted 72 participants, led us to greatly expand our outreach and participation this year," said Norm Chaffee, project coordinator for the event. "The 144 students who attended really challenged our ability to improve on the competition, but support across the center was just fantastic, and all the students had a memorable experience. Special thanks go to competition managers Nancy Robertson and Bonnie Dunbar, who made my job easy."

Organized into four "company" teams (Rockdonnell, Vulture Aviation, Vereinigten Flugfahrten and Grumbo Aerospace), the students worked against a deadline to design, develop and present their concept of a human community on Mars that would support 12,000 residents. They had to design an overall structure, define sources of construction materials, specify vehicles used for transportation, determine sources of electrical power and water, design computer and robotics systems, specify allocation of interior space, show examples of community design, and provide estimated costs and schedules for completion of the project.

To assist the students, each team was provided with a manager from government or industry to act as the company chief executive officer. Volunteer CEOs were Kevin Moore, NASA JSC (Grumbo Aviation); Keith Todd, NASA JSC (Rockdonnell); Jon Zelon, The Boeing Company (Vereinigten Flugfahrten); and Ramesh Khatri, United Space Alliance (Vulture Aviation).

"I see a lot of enthusiastic students here," said Khatri, director of Space Flight Operations for USA. "All of them have done their homework. They have a lot of knowledge of the planet Mars and all the research that has been done on it."

The CEOs agreed that the main lesson the students learned was how to work together. "One of the key things the students will learn is teamwork," Khatri added. "They will also learn how the real world operates. So I think the experience will be very enriching for them."

"I think that the students are going to learn to work as a team," said Todd, robotics project lead for Mission Operations. "Given an overwhelming problem, they are

"I'm really excited about architecture and futuristic designs," said Thomas Mosley, Silsbee High School student and member of the Grumbo Aerospace team. "I saw this competition advertised at a job fair, and I really wanted to come to it."

The students participated in the competition to learn more about Mars and to gain skills that will help them later in life. "I would like to learn to be a leader, and I would like to learn communication skills," said Alyssa



Second annual Mars Settlement Design Competition draws increased participation

going to see how teamwork will help them meet their objectives."

Other volunteers conducted training sessions for the students before the actual competition began. These short seminars gave the participants a critical overview of structural engineering, operations engineering, human engineering, automation engineering, and management.

"I like robotics and I wish I could have had the opportunity to participate in this kind of competition when I was a kid, so I'm taking my opportunity by being a trainer," said Reyes Granados, USA Mission Operations Directorate robotics analyst for the space shuttle and the space station, who helped conduct the training session on automation engineering. As president of the Society of Mexican American Engineers and Scientists, Granados also represented MAES at the competition.

The students divided themselves into teams and decided what their roles would be. Working with others whom they had not met before, they learned important lessons in engineering, proposal writing, presentation skills and teamwork. All were excited to be involved in the competition.

Goodenberger, Clear Creek High School student and Grumbo Aerospace team member. "I want to have fun designing this community and learn something for real life when I join the workforce."

Most of the students came from high schools in Houston and Southeast Texas, but six traveled from Iowa to participate in the competition.

"We want to bring this experience back to Iowa because there is a Mars base program there for junior high students in our school system," said Brianne Tabke, a student at Woodbury Central High School in Iowa. "It would be really helpful if we could get all that we can from this to bring it back home."

Following 35-minute presentations of their 50-page proposals to a team of local NASA and industry judges during Sunday morning, the final day of the competition, the team members took a tour of JSC. The winning team, Vulture Aviation, was announced during an awards ceremony in the afternoon.

The competition was hosted and sponsored by NASA JSC, The Boeing Company, the Clear Creek Independent School District and the American Institute of Aeronautics and Astronautics. ■



Not on file: *Engineer Highlight*

Title: NASA Deputy Manager, TransHab Project.

Time at JSC: 17 years including three as a co-op.

Education: University of Texas, B.S., mechanical engineering; Stanford University, M.S., mechanical engineering.

Favorite music: Classic rock, some Christian rock and some alternative rock.

Favorite book or movie: The best I can do here is to say that my favorite magazine is *Invention & Technology* and my favorite show is the weekly *Car Talk* on National Public Radio.

When away from JSC: I am very interested in photography – in fact, the shots in my office were taken from Yosemite and the Grand Canyon. I also enjoy biking and am very involved in “Ultimate” Frisbee.

What you like about NASA...and your job at JSC: The fact that we are doing exciting things. That we are going to space! You couldn’t trade this job for anything!

Background: If you ever have a moment to talk with JSC’s George Parma, it won’t take you long to resolve that this individual is very passionate about his work. His enthusiasm for the projects he works on, in the past as well as present, transcend into his work and likely are what have positioned him as the “go to” guy for many of JSC’s complicated pet projects.



George Parma is joined by Chris Miller (left) for some Ultimate recreation.

Name: **George Parma**

His role in the TransHab project may be his most challenging yet – but he certainly has a past that has groomed him for the task.

Like so many other successful JSC employees, Parma began at NASA as a co-op – his first taste of the space program was as a flight controller with the mechanical systems group for STS-6 back in 1983. He went on rotations in Engineering’s structures, propulsion, and crew systems divisions, but knew he had found his home in mechanical design.

After completing a NASA fellowship at Stanford for a master’s in mechanical engineering, Parma returned to JSC to work in

robotics which opened the door to his first big project – SPIFEX.

Parma calls his role as the project manager for the Shuttle Plume Impingement Flight Experiment his dream job.

“That project was really unique,” said Parma. “We were able to accomplish so much even though we had to beg, borrow and steal to get the job done.”

Used on STS-64, SPIFEX was a project that incorporated a 32-foot extension onto the end of the shuttle’s robotic arm and recorded measurements that were used to verify computer modeling of orbiter propulsion plumes.

Parma’s success with the SPIFEX branded him as a leader and when NASA focused its attention on developing a new emergency crew return vehicle, he found himself being asked to help start the team.

For Parma, working on the X-38 represented a new “faster, better, cheaper” approach to building spacecraft.

“On the X-38 you have to rely on a lot of good judgment and good engineering sense – you have to know you have good people on your team and let them run with the ball,” said Parma. “Plus you spend a lot of time hands-on the vehicle – I logged a lot of hours doing mechanical tests and adjustments in a hot airplane hanger at NASA Dryden.”

Parma’s space flight management experience is what brought him to the TransHab project. “They needed someone who had taken a project from the cradle to flight, someone who knew the pitfalls and the hoops to jump through,” explained Parma.

Clearly, the TransHab team is a similarly driven group, motivated by the prospect of seeing their vision become a reality.

“This is trailblazing stuff,” said Parma. “Our team has established that an inflatable, fabric structure can be reliable. We developed the baseline technology and built a full-size model in less than three months. That’s exciting! They’ve talked about using inflatables for 30 or 40 years and we, right here at JSC, are about to push that technology into reality. We are on the cutting edge of the future of spacecraft.” ■

Local TV personality receives NASA award

Sylvan Rodriguez, a familiar face to many Houstonians and JSC employees, was recently awarded NASA’s Distinguished Public Service Medal.

Center Director George Abbey and Associate Director Sue Garman presented Rodriguez with the award at a ceremony last month citing his “exceptional professionalism and objectivity as a journalist and news anchor.” Abbey also commended his “unfailing support to the nation’s space program, and the outstanding inspiration” he provided to youths whose lives he has touched.

Rodriguez began his career as a newscaster in Houston in 1977, including significant

coverage of the nation’s space program. He has covered the Space Shuttle Program since its infancy, including interviews with its foremost leaders. He was a key member of the newscast team that reported on the first shuttle launch and landing, the *Challenger* accident, and many other space programs to date.

In addition to his contributions as a member of the news media, Rodriguez also has been very active in community affairs. His golf tournaments have raised money for many worthwhile programs, including the Challenger Centers that continue to inspire the youth of America to reach for their dreams. ■



Center Director George Abbey, Dr. Shelley Sekula-Rodriguez and Sylvan Rodriguez at a reception recognizing Sylvan’s award.

CONSTRUCTION: *the fascination and the folly*

By Mary Peterson

There’s a reason we liked LEGOS® and Lincoln Logs® as kids. Building things, or seeing them built, has an endless fascination for most of us. And so it is, even at construction sites around JSC, with one glaring exception – we didn’t worry about safety with our playroom skyscrapers. At JSC, we not only do; we must.

Why, then, do we see employees frequently ignoring the yellow barrier tapes where repairs and construction work is being done?

“I think the employees largely misunderstand construction sites and what they are trying to accomplish,” says Ed (Bear) Handwerk, a senior facilities safety engineer for Muñoz Engineering. “The yellow ‘caution’ tapes are both to protect the employees doing the construction work so they will not be distracted, which, in turn, could lead to a mishap, and to keep

non-workers restrained because of the inherent dangers around the worksite,” he said. No one should venture inside posted hard hat areas without authorization and the required safety gear. Further, when heavy equipment is being used, such as a backhoe, an excavator, or a crane, and a person intrudes into the area, this creates a delay or even a complete work stoppage.

Still, there are a few who ignore the yellow barrier tapes, sometimes with comical, sometimes with potentially disastrous, results. “Take, for example,” said Handwerk, “the employee near the Building 3 cafeteria who was in a hurry to get to the ATM machine. Crossing through the barrier tape as a shortcut, the employee stepped in what looked like an ordinary mud puddle. Wrong! It was actually a puddle of mortar mix, and it gets hard real fast!” The construction boss had to stop work to give a hand. So much for instant cement boots.

Other, more serious problems could be dealt by falling building materials or a cave-in at an excavation site. “I recall one instance,” Handwerk said, “when a crane was being used in a sizeable JSC construction area. Because curious employees kept moving in so close, it was necessary to put up a double barrier, one 6 feet outside the original, to be sure they were kept at a safe distance.” A crane operator has many things to watch during operation, including crew signals, and a solitary interloper could go easily unnoticed. Many times the danger posed may not be understood, and should the workmen have to stop or jerk a load, that load could easily fall.

Given that the soil in our area is high sandy-loam content, cave-ins are always a potential threat. By standing too near the edge of an excavation, not only could the intruder fall in, the worker in the pit could be buried as well.

“The rules around construction sites,” says Handwerk, “are different from those

for conventional safety, and in some cases, might lead the casual observer to think that safety rules are not being applied. He cited the case of the employees who reported that construction workers on the Bldg. 3 cafeteria were not “tied off.” What they did not understand was that often, when workers cannot function efficiently with the encumbrances of conventional safety gear, they employ a safety monitoring system, wherein other workers constantly watch and warn them away from potential danger, a technique that is OSHA approved. Fall protection criteria are different for certain construction due to the uniqueness of equipment not found in general industry.

Still, it is important that all JSC employees be aware not only of their safety, but the safety of others, and they are encouraged to report unsafe practices. For those who insist upon ignoring the rules, construction workers have been asked to take badge names of the offenders. ■

Ripped from the ROUNDUP

Ripped straight from the pages of old Space News Roundups, here's what happened at JSC on this date:

1 9 6 5

Gemini spacecraft No. 3, scheduled for a manned three-orbit flight early this spring, was mated to the Gemini launch vehicle on Pad 19 at Cape Kennedy, February 17.

A series of tests of the combined vehicles, including simulated launches and flights, are being conducted to ensure flight readiness.

The launching of the GT-3 flight will be the first spacecraft placed in space by any nation that will be able to change its plane in orbit, as well as change the size of the orbit.

1 9 7 5

The Apollo-Soyuz crews are completing joint training and the Soviet cosmonauts will depart JSC this weekend.

The American astronauts will travel to the Soviet Union in April and the joint crews will undergo a final training session there.

Briefings were held Wednesday on the upcoming mission including an experiments briefing, a hardware briefing, an orbital projectory briefing and a briefing on the joint crew activities.

1 9 8 5

The orbiter *Discovery* sustained no structural damage to its port side forward payload bay door when an access platform struck the vehicle in an accident March 8.

A mechanical technician sustained a broken left fibula and a broken left tibia in the accident.

Discovery was in the Orbiter Processing Facility Bay 2 with payload bay doors closed in preparation for a move to the Vehicle Assembly Building. Located above each orbiter in the OPF are two rolling bridge cranes. Each crane has two payload bay access platforms, also known as buckets, attached to it. One of the buckets on one of the rolling bridges was in use and the other was raised and stowed.

At one point, when the rolling beam started to move in order to translate the unstowed bucket, the stowed bucket began to descend. The bucket continued to descend until it contacted a 45-degree platform guy-wire and then followed that wire down until it struck the orbiter.



Safety, Reliability & Quality Assurance Directorate accepts first George Award



NASA JSC Photo JSC2000-01350 by Benny Benavides

The first annual George Award goes to the Safety, Reliability, and Quality Assurance Office for having an astonishing 97 percent participation in the 1999 Safety & Total Health Day health run/walk event, the highest of any directorate. Presenting the trophy to Col. John Casper (right), director, Safety, Reliability, and Quality Assurance Office, are Center Director George Abbey (left) and Dr. Dave Williams, director of the Space and Life Sciences Directorate.

GILRUTH CENTER NEWS

Sign up policy:

All classes and athletic activities are on a first-come, first-served basis. Sign up in person at the Gilruth Center and show a yellow Gilruth or weight room badge. Classes tend to fill up two weeks in advance. Payment must be made in full, cash or by check, at the time of registration. No registration will be taken by telephone. For more information, call x33345

Gilruth badges:

Required for use of the Gilruth Center. Employees, spouses, eligible dependents, NASA retirees and spouses may apply for photo identification badges from 7:30 a.m.-9 p.m. Monday-Friday and 9 a.m.-2 p.m. Saturdays. Cost is \$10. Dependents must be between 16 and 23 years old.

Open from 6:30 a.m.-10 p.m. Monday-Thursday, 6:30 a.m.-9 p.m. Friday, and 9 a.m.-2 p.m. Saturday. Contact the Gilruth Center at (281) 483-3345. <http://www4.jsc.nasa.gov/ah/exceaa/Gilruth/Gilruth.htm>

Nutrition intervention program: Six-week program includes lectures, a private consultation with the dietitian and blood analysis to chart your progress. Program is open to all employees, contractors and spouses. For details call Tammie Shaw at x32980.

Defensive driving: One-day course is offered once a month at the Gilruth Center. Pre-registration required. Cost is \$25. Call for next available class.

Stamp club: Meets every second and fourth Monday at 7 p.m. in Rm. 216.

Weight safety: Required course for employees wishing to use the Gilruth weight room. Pre-registration is required. Cost is \$5. Annual weight room use fee is \$90. The cost for additional family members is \$50.

Exercise: Low-impact class meets from 5:15-6:15 p.m. Mondays and Wednesdays. Cost is \$24 for eight weeks.

Step/bench aerobics: Low-impact cardiovascular workout. Classes meet from 5:15-6:15 p.m. Tuesdays and Thursdays. Cost is \$32 for eight weeks. Kristen Taraszewski, instructor.

Yoga: Stretching class of low-impact exercises designed for people of all ages and abilities in a Westernized format. Meets Thursdays 5-6 p.m. Cost is \$32 for eight weeks. Call Darrell Matula, instructor, at x38520 for more information.

Ballroom dancing: Classes meet Thursdays from 6:30-7:30 p.m. for beginner, 8:30-9:30 p.m. for intermediate and 7:30-8:30 p.m. for advanced. Cost is \$60 per couple.

Country and western dancing: Beginner class meets 7-8:30 p.m. Monday. Advanced class (must know basic steps to all dances) meets 8:30-10 p.m. Monday. Cost is \$20 per couple.

Fitness program: Health-related fitness program includes a medical screening examination and a 12-week individually prescribed exercise program. For details call Larry Wier at x30301.

Aikido: Martial arts class for men and women meets 5-6 p.m. Tuesdays and Wednesdays. No special equipment or knowledge is needed to participate. Aikido teaches balance and control to defend against an opponent without using strength or force. Beginning and advanced classes start each month. Cost is \$35 per month.

TICKET WINDOW

The following discount tickets are available at the Exchange Stores

General Cinema Theaters	\$5.50
Sony Loew's Theaters	\$5.50
AMC Theaters	\$5.00
Fiesta Texas	adult .. \$20.50 .. child (under 48 inches) .. \$17.25
Astroworld Early Bird (use by June 18)	\$17.25
Astroworld	1 day .. \$21.00 .. 2 day .. \$31.00
Water World	\$21.00
Moody Gardens (2 events) (does not include Aquarium Pyramid)	\$10.75
Moody Gardens (Aquarium only)	\$9.25
Sea World	adult .. \$29.00 .. child (3-11 years) .. \$19.25
Space Center Houston	adult .. \$11.00 .. child (age 4-11) .. \$7.25
(JSC civil service employees free.)	
Space Center Houston annual pass	\$18.75
Splash Town	1 day .. \$13.00 .. Season Pass .. \$37.50
Postage Stamps (book of 20)	\$6.60

Please bring your driver's license to pay by personal check.

Exchange Store hours

Monday-Friday
Bldg. 3 7 a.m.-4 p.m.
Bldg. 11 9 a.m.-3 p.m.

- All tickets are nonrefundable.
- Metro tokens and value cards are available.
- Houston Cellular Phone Fair, Building 11, March 7-10, 9 a.m.-3 p.m.

For additional information, please call x35350.

New sightings Web site helps space fans and students

Undergraduate work on a Web-based software program has helped two computer science students join the space center ranks, while helping people around the world track NASA satellites as they fly overhead.

NASA SkyWatch is an easy-to-use online tool allowing individuals to get real-time acquisition and sighting data on prominent NASA satellites as they orbit the Earth (<http://spaceflight.nasa.gov/realdata/sightings/>). William Tracy, United Space Alliance flight dynamics officer, spearheaded development of the SkyWatch software program and through a USA-sponsored student work partnership, enlisted the help of Texas Southern University computer science students to make the program adaptable for the Web.

"It works out great," said Tracy. "The students get to see how tools are used in industry and we benefit from the skills of really talented students."

Shaji Markose and Richard Osborne are two of the students who worked on SkyWatch. Since then, both computer science graduates have joined USA as full-time employees, putting their skills and interests to work for the space program.

Osborne, in the Advanced Technology Development Group, said before working on the program he always thought he'd go to work in the video game development industry, but his experience with SkyWatch changed that.

"I couldn't wait to wake up and go to work at NASA," said Osborne. "And working with Tracy was great – his enthusiasm is contagious and you could tell he was passionate about the project. We worked many late nights on it."

Their hard work has reaped wonderful rewards.

When you visit the site, you'll find a feature rich tool that has been designed to be easy to understand, while still providing enough technical details for serious astronomy fans.

"There are other sites out there, but SkyWatch is the only one that uses actual



The SkyWatch team includes, clockwise from top, Richard Osborne, USA; William Tracy, USA; Kelly Humphries, NASA; and Kim Dismukes, Indyne, Inc. Not pictured: Shaji Markose, USA.



The SkyTrack feature produces a custom image per the reviewer's locale that presents the path of the satellite or vehicle in relation to the visible stars. Using the site, visitors can track the International Space Station, satellites or the space shuttle during missions.

Popular Science recognized JSC's Human Space Flight Web in its listing of the Web's 50 hottest sci-tech sites. In a fall issue, the publication cited the usefulness of the SkyWatch function.

Mission Control data," explained Tracy. "Additionally, we are the only ones that can forecast shuttle entry sightings. That is true atmospheric flight – there is no other Web application that can do that."

"Having the opportunity to walk outside your house and see the shuttle or station fly over makes the space program more tangible," added Tracy. "It makes people feel like they are part of it."

"It puts the space program on a more personal level," added Kim Dismukes, IMPASS manager for the Human Space Flight Web site. "When people see the shuttle or the station, it brings the space program to life."

Before the launch of SkyWatch, space program fans were limited to text listings of sighting opportunities. Those listings are still available, but by identifying a

city or specifying a location using latitude and longitude, this Web-based Java application can produce an image of the satellite trajectory against the backdrop of stars as they would be seen at the location. Known as SkyTrack, this feature is one of the most popular. The SkyWatch site also provides digital data such as Azimuth (degrees East of North), elevation (degrees above the horizon), and range (miles) throughout the pass.

"It's a very interactive program," said Kelly Humphries, NASA manager for the Human Space Flight Web site. "We look at SkyWatch as an example of what's to come for the Human Space Flight Web. We hope to incorporate more, similar features that make the users feel as if they are part of the Mission Control Center and part of the NASA team." ■

JSC to observe St. Patrick's Day

On Friday, March 17, the JSC St. Patrick's Day Observance will be held at 11:30 a.m. in the Bldg. 3 cafeteria. Come hear the Houston Highlander Bagpipers perform under the direction of Ian Martin. The bagpipers are well-known to the JSC community and surrounding areas.

They have performed at JSC's American Heritage Week, St. Patrick's Day Observance, the Robert Burns Dinner, the St. Patrick's Day parade in downtown Houston, and Dickens on the Strand, just to name a few.



Aerospace medical conference to meet in Houston

The 71st Aerospace Medical Association Annual Scientific Meeting will take place at the Westin Galleria & Oaks May 14 – 18. The event, titled "New Horizons in Aviation and Space Medicine," will feature seminars ranging from accident investigation to clinical and operational space medicine. There also will be an astronaut panel and lectures from former NASA Flight Director Eugene Kranz, Director of Space and Life Sciences Dave Williams and Dr. Stanley White, former JSC project officer and former AsMA president. For meeting and registration information visit www.asma.org or contact Dr. Paul Stoner at x39648. Advance registration closes April 17.

PEOPLE on the **MOVE****Human Resources reports the following personnel changes:****Key Management Assignments**

Robert Kelso was named deputy director, Safety, Reliability, and Quality Assurance Office.

John McManamen was selected as deputy chief, Structures and Mechanics Division, Engineering Directorate.

Bruce Sauser was selected as chief, Life Support and Habitability Systems Branch, Crew and Thermal Systems Division, Engineering Directorate.

Additions to the Workforce

John Osborn joins Cargo, Integration, and Operations Branch, Operations Division, Mission Operations Directorate, as a flight systems operator.

Mark Dub joins the Advanced Development Office, Engineering Directorate, as a design engineer.

Colleen Crawford joins the Avionics and Software Office, International Space Station Program, as an avionic systems engineer.

Promotions

Fran Magers was selected as an accounting assistant in the Resource Control and Reimbursables Branch, Financial Management Division, Office of the Chief Financial Officer.

Elizabeth Ceja was selected as division secretary in the Occupational Safety and Institutional Assurance Division, Safety, Reliability, and Quality Assurance Office.

Telma Lopez was selected as division secretary in the HEDS Independent Assurance Office, Safety, Reliability, and Quality Assurance Office.

Desiree Patterson was selected as division secretary in the Space Station Division, Safety, Reliability, and Quality Assurance Office.

Marilyn Lewis was selected as division secretary in the Program Integration Office, International Space Station Program Office.

Reassignments Between Directorates

David Black moves from the Mission Operations Directorate to the Office of the Chief Information Officer.

Steve Gorman moves from the Engineering Directorate to the Office of the Chief Information Officer.

Howard Hu moves from the International Space Station Program Office to the Engineering Directorate.

Linda Perez moves from the Office of the Chief Information Officer to the Information Systems Directorate.

Delmar Douglas moves from the Information Systems Directorate to the International Space Station Program Office.

Bill Jordan moves from the Space Shuttle Program Office to the International Space Station Program Office.

Reassignments Between Centers

Marilyn Donald moves to Stennis Space Center.

Ledetria Beaudoin moves to NASA Headquarters.

Denny Kross moves to Marshall Space Flight Center.

Sheryl Gates moves to Marshall Space Flight Center.

Retirements

Herb Chee of the Legal Office.

Billie Deason of the Public Affairs Office.

Duane Emmons, Marsha Fuller, Claudia Hess, and George Hyde of the Procurement Office.

Steve Oswald and Danny Taylor of the Flight Crew Operations Directorate.

Richard Bullock, Joyce Davis, C. D. Hyatt, Linda Nataro, Robert Rice, Marsha Rubin, and Bob Stanley of the Engineering Directorate.

Resignations

Sally Branson of the Office of the Chief Financial Officer.

Brant Adams and Tony Sang of the International Space Station Program Office.

Nelda Howell of the Safety, Reliability, and Quality Assurance Office.

NASA BRIEFS**TINY HEARTS MONITORED BY NASA TECHNOLOGY**

The results are in. A NASA technology originally used to measure airflow over airplane wings has been successfully used to develop a portable, non-invasive, easy-to-use fetal heart monitor.

The new clinically proven fetal heart monitor takes advantage of aerospace technology to make it more affordable, portable and easy to use by expectant mothers in their own homes. What's more, it "listens, documents and stores" fetal heart-rate data without injecting energy into the womb, making it totally non-invasive.

A team of aerospace researchers from Langley Research Center worked with Veatronics, Inc., of Charlotte, NC, to convert the technology to this innovative medical application. NASA granted the company a license to market one or more commercial products based on the technology.

"Because the material we used for wing surface measurements is flexible, it is ideally suited to fit over the curved surface of a maternal abdomen for fetal testing," said Allan Zukerwar of Langley's Advanced Measurement and Diagnostics Branch.

Current fetal heart-monitoring devices generally work well but cost many thousands of dollars and can only be used in a clinic or doctor's office.

NASA developed the portable technology at the suggestion of a medical doctor in a remote area that suffers from a lack of appropriate health care.

In its present form, an at-home patient would strap a wide, soft belt embedded with sensors over her belly, tune a computerized control device to hear the fetal heartbeat and send the signal directly to her doctor's office via the Internet.

CREWS NAMED TO CONTINUE SPACE STATION ASSEMBLY

Veteran shuttle Commanders James Halsell and Terrence Wilcutt will lead the next two space shuttle missions to continue on-orbit assembly of the International Space Station.

Halsell will lead a crew of seven on the STS-101 mission, which is scheduled to launch aboard Space Shuttle *Atlantis* no earlier than April 13. Pilot Scott Horowitz and Mission Specialists Mary Ellen Weber and Jeffrey Williams will remain as part of the STS-101 crew. Completing the STS-101 crew are Mission Specialists James Voss, Susan Helms, and Cosmonaut Yuri V. Usachev, who all later will serve as the second resident International Space Station crew.

Three mission specialists previously assigned to STS-101, Ed Lu and Cosmonauts Yuri Malenchenko and Boris Marukov, will move to the STS-106 mission to perform tasks linked to the planned July arrival of the Russian-built Service Module.

Wilcutt will lead the seven-member crew on the STS-106 mission, which is scheduled to launch aboard Space Shuttle *Atlantis* no earlier than August 19. Joining Wilcutt, Lu, Malenchenko and Marukov are Pilot Scott Altman and Mission Specialists Richard Mastracchio and Dan Burbank. STS-106 will be the first space flight for Burbank and Mastracchio, members of the 1996 class of astronauts.

DATES & DATA**March 10**

Astronomers meet: The JSC Astronomical Society will meet at 7:30 p.m. at the Center for Advanced Space Studies, 3600 Bay Area Blvd. For details contact Chuck Shaw at x35416.

March 12

Westside NSS meets: The "Westside" group of the Clear Lake area chapter of the National Space Society will meet at 2 p.m. at Silicon Graphics, 11490 Westheimer, Suite 100. For details contact Murray Clark at (281) 367-2227.

March 14

Aero Club meets: The Bay Area Aero Club will meet at 7 p.m. at the Houston Gulf Airport clubhouse at 2750 FM 1266 in League City. For information contact Larry Hendrickson at x32050.

NSS meets: The Clear Lake area chapter of the National Space Society will meet at 6:30 p.m. at Freeman Memorial Branch Library, 16602 Diana Lane. For information contact Murray Clark at (281) 367-2227.

March 15

Astronomy seminar: The JSC Astronomy Seminar Club will meet at noon March 15, 22, and 29 in Bldg. 31, Rm. 248A. For more information contact Al Jackson at X35037.

Call for Papers: Today is the deadline for abstract submissions to AIAA's Annual Technical Symposium at the University of Houston April 6 and 7. The event is titled "Pioneering a New Millennium of Technology and Discovery." For more information visit www.jsc.nasa.gov/aiaa/

OUT&ABOUT ★

Dr. Michael Stanford, acclaimed ion radiation expert and chief of Research and Technology Development at University of Texas Medical Branch Center for Aerospace Medicine, stressed the importance of understanding the physics and risks associated with space radiation environment and its impact on crew safety and spacecraft design at a recent luncheon. For information on IEEE Galveston Bay section and AIAAHouston section, which co-sponsored the February 10 luncheon, visit IEEE at <http://www.ghgcorp.com/ieeegbs> or AIAA at <http://www.jsc.nasa.gov/aiaa>.

Scuba club meets: The Lunarfans will meet at 7:30 p.m. For more information contact Mike Manering at x32618.

Spaceteam Toastmasters meet: The Spaceteam Toastmasters will meet at 11:30 a.m. March 15, 22 and 29 at United Space Alliance, 600 Gemini. For information contact Patricia Blackwell at (281) 280-6863.

SPACE CENTER Roundup

The Roundup is an official publication of the National Aeronautics and Space Administration, Johnson Space Center, Houston, Texas, and is published by the Public Affairs Office for all space center employees. The Roundup office is in Bldg. 2, Rm. 181. The mail code is AP3. The main telephone number is x38648, and the fax is x32000. Electronic mail messages may be directed to:

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